

I claim:

1. A capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition under test during operation of the hybrid ignition, the hybrid or DIS ignition having a housing of a predetermined configuration, a first output to a first spark plug and a second output to a second spark plug, the capacitive probe comprising:

a base configured for removable attachment to a hybrid or DIS ignition under test,

a single capacitive sensor disposed on the base, the capacitive sensor having an electrical lead connected thereto,

wherein the capacitive probe is configured to simultaneously detect a first electric near field developed by a first high voltage signal in a hybrid or DIS ignition first output to a first spark plug and a second electric near field developed by a second high voltage signal in a hybrid or DIS ignition second output to a second spark plug, and

wherein the signal output from the capacitive sensor comprises a positive-going signal component from one of the first electric near field and second electric near field and a negative-going signal component from the other one of the first electric near field and second electric near field.

2. A capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition under test during operation of the hybrid or DIS ignition according to claim 1, wherein the base is configured to provide an interference fit with at least two opposing surfaces of the hybrid or DIS ignition housing.

3. A capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition under test during operation of the hybrid or DIS ignition according to claim 1, further comprising:

a fastening device to removably fasten the capacitive probe base to a hybrid or DIS ignition coil housing, and

wherein the single capacitive sensor is configured to move between at least a first position and a second position along at least one axis relative to the base so as to permit the capacitive sensor to be positioned between a first output of a hybrid or DIS ignition coil under test to a first spark plug and a second output of a hybrid or DIS ignition coil under test to a second spark plug, the capacitive sensor having an electrical lead connected thereto.

4. A capacitive probe according to claim 3, wherein the base is adjustable to accommodate a plurality of housing configurations.

5. A capacitive probe according to claim 4, wherein the base is substantially U-shaped.

6. A capacitive probe according to claim 4,
wherein the base comprises a first portion and a second portion, two portions being movable relative to each other,

wherein the base comprises a first locking member for locking the first portion and a second portion together.

7. A capacitive probe according to claim 6,
wherein each of the first portion and the second portion have, in combination, a substantially U-shaped cross-section along one axis.
8. A capacitive probe according to claim 3, wherein the probe comprises a second locking member one at least one of the base and the capacitive sensor to lock the capacitive sensor in at least one of the first position, the second position, and a position between the first position and second position.
9. A capacitive probe according to claim 3, further comprising:
at least one of a capacitor and a resistor electrically coupled to the capacitive probe to substantially equalize the magnitudes of the signal components output from the capacitive probe corresponding to the detected first and second electric near fields.
10. A capacitive probe according to claim 4, further comprising:
a ferrite-core suppression device coupled to the electrical lead to mitigate spurious signal oscillations.
11. A capacitive probe according to claim 10, wherein the suppression device comprises an inductive device adapted to reduce loop gain to less than unity over a range of high frequencies.

12. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing, comprising the steps of:

providing a capacitive probe comprising a body and a single capacitive signal detector;

placing the single capacitive signal detector proximate an exterior of a hybrid or DIS ignition coil housing at a position corresponding to an overlap of a first electric near field corresponding to a first output of a hybrid or DIS ignition coil under test and a second electric near field corresponding to a second output of a hybrid or DIS ignition coil under test, the first and second electric near fields being generated when each of the first and second outputs are at a high voltage corresponding to at least a portion of an ignition spark;

using the single capacitive signal detector to simultaneously detect the first electric near field the second electric near field; and

outputting from the single capacitive signal detector a signal representative of the first electric near field and the second electric near field.

13. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing according to claim 12, wherein the placing step further comprises placing the single capacitive signal detector proximate an exterior of a hybrid or DIS ignition coil housing at a position between a first output of a hybrid or DIS ignition coil under test to a first spark plug and a second output of a hybrid or DIS ignition coil under test to a second spark plug.

14. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid ignition coil housing according to claim 13, further comprising the step of:

processing the signal output by the single capacitive signal detector using at least one of a signal processor and an amplifier.

15. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing according to claim 14, further comprising the step of:

reporting the signal output by the single capacitive signal detector to at least one of a display device, a printing device, a communication device, and an electronic storage device.

16. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing according to claim 14, further comprising the step of:

attaching the single capacitive signal detector proximate the first output and the second output of the housing of the hybrid or DIS ignition coil under test.

17. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing according to claim 14, wherein the step of placing the single capacitive signal detector proximate the ignition coil housing comprises placing the single capacitive signal detector near a portion of the housing adjacent both the secondary ignition coil and one of the first output and the second output associated with a companion spark plug.

18. A method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing according to claim 17, wherein the step of placing the single capacitive signal detector proximate the ignition coil housing comprises placing the single capacitive signal detector closer to the secondary ignition coil than one of the first output and the second output associated with a companion spark plug.

19. A method for simultaneously detecting a plurality of electric near fields present proximate an exterior of a hybrid or DIS ignition coil housing according to claim 18, wherein the step of placing the single capacitive signal detector proximate the ignition coil housing comprises placing the single capacitive signal detector closer one of the first output and the second output associated with a companion spark plug than to the secondary ignition coil.